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**Résultats esthétiques et complications des cicatrices de césarienne
: évaluation à six mois par le questionnaire Patient And Observer
Scar Assessment Scale**

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par **Juliette PRUVOST**

JURY

Président :

Monsieur le Professeur Damien SUBTIL

Assesseurs :

Madame le Docteur Louise GHESQUIERE

Madame le Docteur Yasmine OULD HAMOUD

Directeur de thèse :

Monsieur le Professeur Charles GARABEDIAN

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RÉSUMÉ

Contexte : La césarienne est une intervention chirurgicale fréquente à l'échelle mondiale. Au-delà des risques de complications à court et long terme, l'esthétique de la cicatrice, influencée par les caractéristiques maternelles et les techniques chirurgicales, représente un facteur déterminant de la satisfaction des patientes.

Objectif : Évaluer la satisfaction des femmes concernant l'aspect esthétique de leur cicatrice six mois après césarienne en utilisant l'échelle Patient and Observer Scar Assessment Scale et identifier les facteurs maternels et chirurgicaux associés.

Méthodes : Il s'agit d'une étude comparative monocentrique, réalisée à Lille entre novembre 2022 et mars 2023. L'évaluation du critère de jugement principal reposait sur l'échelle POSAS (Patient and Observer Scar Assessment Scale), un score sur 60 points, où une valeur plus basse indique un meilleur résultat esthétique avec trois questions supplémentaires : satisfaction, douleur, complications locales (hématome, infection, désunion, reprise chirurgicale, sérome). Les données ont été analysées selon les caractéristiques maternelles et chirurgicales.

Résultats : Parmi les 328 femmes éligibles, 176 (53 %) ont répondu. Le score médian POSAS était de 28 (17–36). Un meilleur résultat esthétique de la cicatrice et une meilleure satisfaction étaient observés chez les femmes ayant des antécédents de césarienne, non fumeuses, et opérées par laparotomie selon Joel Cohen. Des complications post-opératoires ont été rapportées par 20,5 % des répondantes, les plus fréquentes étant la désunion (11,9 %), l'hématome (10,2 %) et l'infection (9,1 %). Leur survenue était significativement plus fréquente chez les patientes ayant un IMC ≥ 30 kg/m² (37 % vs 16 % ; p=0,01), en cas de fermeture par agrafes (50 % vs 12 % fil résorbable et 22 % non résorbable ; p=0,031) ou après laparotomie selon Mouchel (56 % vs 19 % Joel Cohen et 17 % Pfannenstiel ; p=0,041).

Conclusion : Ces résultats soulignent l'impact des choix chirurgicaux et des facteurs maternels sur l'esthétique et les complications des cicatrices de césarienne, renforçant l'intérêt d'une approche individualisée et d'un suivi à long terme.

Mots-clés

Esthétique, Césarienne, POSAS, Fermeture cutanée, Complications de paroi

INTRODUCTION

À l'échelle mondiale, la césarienne est l'une des interventions chirurgicales les plus courantes. Entre 2000 et 2015, la prévalence des césariennes a fortement augmenté passant de 16,0 millions (12,1 %) à 29,7 millions (21,1 %) des naissances, avec des taux variables selon les régions (1). Selon l'enquête périnatale de 2021 en France, 21,4 % des naissances ont eu lieu par césarienne (2).

Parmi les complications maternelles à court et à long terme de la césarienne, l'apparence esthétique de la cicatrice est un facteur majeur de satisfaction des patientes (3,4). L'apparence finale de celle-ci est influencée par des facteurs liés à la patiente et au processus naturel de cicatrisation, ainsi que des facteurs techniques dépendant du chirurgien (5,6). La fermeture cutanée à l'aide de sutures, bien que celles-ci soient plus longues à réaliser et reposent sur l'expertise chirurgicale, est considérée comme la méthode standard. En revanche, les agrafes, appréciées pour leur rapidité d'utilisation, entraînent généralement une moindre satisfaction des patientes et un risque accru d'infection locale (7–9).

Concernant les résultats esthétiques après césarienne, dans l'essai de Cromi et al., aucune différence significative entre la fermeture cutanée par sutures continues ou par agrafes n'était observée à 6 mois de suivi post-opératoire (10). Ces résultats reposaient sur l'utilisation de l'échelle Patient and Observer Scar Assessment Scale (POSAS), un outil standardisé introduit en 2004, permettant d'évaluer les caractéristiques des cicatrices à la fois du point de vue du patient et de celui de l'observateur (10–12). Cette approche est particulièrement précieuse, car elle intègre la perception du patient, souvent différente de celle des professionnels de santé (13). Depuis cette première étude, l'échelle POSAS a largement été adoptée dans la recherche sur l'esthétique des cicatrices de césarienne. Cette échelle a notamment été utilisée dans cinq des douze études incluses dans une méta-analyse menée par Mackeen et al. en 2015 (9). Cette analyse ne révélait aucune différence significative dans l'apparence des cicatrices entre les

techniques de fermeture cutanée par sutures ou agrafes à deux mois du postpartum. En revanche, Fleisher et al., utilisant également l'échelle POSAS comme critère principal, rapportaient des résultats cosmétiques supérieurs avec la fermeture par sutures par rapport à la fermeture par agrafes (4).

Concernant les complications, la méta-analyse de Clay et al. regroupant cinq essais et 877 femmes montrait que les agrafes étaient associées à un score composite de complications 2,2 fois plus élevé que les sutures ($p = 0,003$) (14). Toutefois, l'utilisation des agrafes permettait de réduire le temps opératoire d'environ cinq minutes par rapport aux sutures.

Les études récentes étudiant l'esthétique des cicatrices post-césarienne se sont principalement focalisées sur la technique de fermeture cutanée, sans prendre en compte d'autres facteurs pouvant influencer les résultats (8,10,15,16). De plus, la plupart de ces études ont limité leur suivi aux complications survenant jusqu'à la sortie de l'hôpital ou dans les six semaines suivant la césarienne, avec peu de données disponibles au-delà de cette période. Par ailleurs, le suivi des patientes par différents professionnels de santé après leur sortie a pu entraîner une sous-estimation des complications dans les études rétrospectives, limitant ainsi l'accès à des informations médicales complètes pour la recherche (17).

Dans ce contexte, l'objectif principal de notre étude était d'évaluer la satisfaction des patientes concernant l'apparence esthétique de leur cicatrice à six mois post-opératoire, en s'appuyant sur le score de l'échelle POSAS ainsi que sur les caractéristiques maternelles et spécifiques de la césarienne. L'objectif secondaire visait à analyser la douleur ressentie, la satisfaction globale vis-à-vis des cicatrices, ainsi que les taux et types de complications survenus durant les six premiers mois suivant l'intervention.

Les sections ci-après sont rédigées en anglais et correspondent au manuscrit en cours de soumission pour publication.

ARTICLE

TITLE AND AUTHORS

**Aesthetic outcomes and complications of cesarean scars: A
6-month evaluation using the Patient and Observer Scar
Assessment Scale**

Affiliations

J. PRUVOST^{1,2}, A. WOJTANOWSKI^{2,3}, J. DE JONCKHEERE^{2,3}, L. GHESQUIERE^{1,2}, C.
GARABEDIAN^{1,2}

1 CHU Lille, Department of obstetrics, F59000 Lille, France

2 Univ Lille, ULR 2694 – METRICS, F59000 Lille, France

3 CHU Lille, CIC-IT, F59000 Lille, France

Corresponding Author

J. PRUVOST¹

ABSTRACT

Introduction: The rates of cesarean section, a common surgical procedure, are increasing globally. Among the procedure's short- and long-term maternal complications, scar aesthetic, a key factor in women satisfaction, is influenced by individual differences and surgical techniques. The present study aimed to evaluate women's satisfaction with the aesthetic outcome of their cesarean section scars 6 months postoperatively using the Patient and Observer Scar Assessment Scale, and to identify associated maternal and surgical factors.

Material and Methods: This monocentric comparative study was conducted in Lille, France, and included women who underwent cesarean section between November 2022 and March 2023. At 6 months post-cesarean section, eligible women completed the 60-point Patient and Observer Scar Assessment Scale (with lower scores indicating better aesthetic results), and satisfaction, pain, and complications (ie, hematoma, infection, dehiscence, surgical reintervention, and seroma) were assessed. Maternal and cesarean section characteristics data were then analyzed.

Results: Of the 328 eligible women, 176 (53%) responded. The median Patient and Observer Scar Assessment Scale score was 28 (17–36). Better aesthetic and satisfaction scores were associated with previous cesarean section, no smoking history, and Joel Cohen laparotomy. Overall, 20.5% of the participants reported at least one complication, the most prevalent being wound dehiscence (11.9%), hematoma (10.2%), and infection (9.1%). Higher complication rates were observed with body mass index ≥ 30 kg/m² (37% vs. 16%; $p = 0.01$), staple skin closure (50% vs. 12% for absorbable and 22% for non-absorbable suture; $p = 0.031$), and Maylard incision (56% vs. 19% for Joel Cohen and 17% for Pfannenstiel incision; $p = 0.041$).

Conclusions: At 6 months post-cesarean section, scar aesthetics were not significantly influenced by closure technique, although those with prior cesarean section showed better outcomes. Higher complication rates were linked to obesity, staples, and Maylard incision.

Keywords

aesthetic, cesarean section, POSAS, skin closure, wound complications

Abbreviations

CS : cesarean

POSAS : Patient and Observer Scar Assessment Scale

RCT : randomized controlled trial

Key message

Cesarean scar aesthetics remain a major concern for women. Using the POSAS scale, we found no significant differences in outcomes by closure method. However, high BMI, use of staples, and Maylard laparotomy increased complication rates.

INTRODUCTION

Globally, cesarean section (CS) is one of the most commonly performed surgical interventions. From 2000 to 2015, the prevalence of CS nearly doubled, from 16.0 million (12.1%) to 29.7 million (21.1%) births, respectively, with rates varying by region (1). For example, according to a perinatal survey, CS was performed in 21.4% of all births in France in 2021(2).

Among the short- and long-term maternal complications of CS, a major factor in women satisfaction is the aesthetic appearance of the scar (3,4). Final scar appearance is influenced by patient-related factors, surgeon-independent aspects of the natural healing process, and surgeon-dependent technical factors (5,6). Sutures are considered the standard method, although they are more time-consuming and rely heavily on surgical expertise. By contrast, while staples are favored for their durability, this method generally results in lower patient satisfaction and increased infection risk (7–9).

Regarding post-CS aesthetic outcomes, Cromi et al. (10) found no significant aesthetic difference between skin closure using continuous sutures or staples at 6-month follow-up based on the Patient and Observer Scar Assessment Scale (POSAS), a standardized clinical research tool introduced in 2004 for assessing scar characteristics from both patient and observer perspectives (10–12). The POSAS is valuable for its inclusion of the patient in scar evaluation, as the perspective of the patient may differ from that of the health-care professional (13). Since the time of that study, the POSAS has been used widely in research to evaluate the aesthetic outcomes of CS scars. Notably, it was used in five of the 12 studies included in a 2015 meta-analysis by Mackeen et al. (9). In their study, no significant difference in scar aesthetic was observed between suture and staple skin closure techniques at 2 months postpartum. By contrast, Fleisher et al., who also used the POSAS score as the primary outcome measure, reported superior cosmetic outcomes with suture-based closures compared with staples.(4).

Regarding complications, in a meta-analysis of five trials and a cumulative 877 participants, Clay et al. found that staples were associated with a 2.2-fold higher composite complication score compared with sutures ($p = 0.003$) (14). However, the use of staples reduced the operative time by approximately five minutes compared to sutures.

Recent studies evaluating CS scar aesthetic outcomes have focused primarily on the method of skin closure, without considering other potential confounding factors (8,10,15,16). Most studies have also concentrated on post-CS complications occurring until hospital discharge or within 6 weeks post-CS, with limited information beyond that time frame. Furthermore, because women are often followed by other health-care professionals post-hospital discharge, retrospective studies may underestimate their complications, thereby reducing research access to medical information (17).

Given this background, the primary aim of the present study was to assess patient satisfaction with the aesthetic appearance of CS scars 6 months postoperatively based on POSAS scores and CS characteristics. The secondary objective was to evaluate patient pain, overall satisfaction with CS scars, and complication rates and types during the first 6 postoperative months.

MATERIALS AND METHODS

This monocentric (Lille, France), comparative study was conducted from November 2022 to March 2023. In our university center, there were 5000 births during each of these years, 21% of which were CS deliveries (11% scheduled, 10% during labor).

The inclusion criteria were women who underwent CS (scheduled or during labor), age 18–45 years, gestational age ≥ 24 weeks, and a viable fetus at delivery. The exclusion criteria were uncontrolled preexisting diabetes (HbA1c $> 6\%$), clinical signs of infection at delivery, a history of keloids on any previous scar, a condition requiring chronic corticosteroids or immunosuppressants, and substance or alcohol use during pregnancy.

Medical record data collected included maternal age, body mass index (BMI), gestational and pregestational diabetes, parity, active smoking, CS history, singleton or multiple pregnancy, and gestational age at delivery. The CS characteristics recorded were: laparotomy type (Joel Cohen, Pfannenstiel, or Maylard [incision of rectus muscle]), scheduled, before labor or during labor (with emergency degree defined as green, orange, or red), time of delivery (whether between 08:00 and 18:00 or on duty) (18,19), and medical device for wound closure (staples [Proximate Plus MD[®], multi-directional release skin stapler], absorbable intradermal running suture [Monocril[®] 3-0], associated or not with subcutaneous stitches with [Polysorb[®] 2-0], or noncontinuous nonabsorbable suture [Filapeau[®] 3-0]).

The maternal questionnaire included the seven patient POSAS components (pain, itchiness, color, stiffness, thickness, irregularity, and overall satisfaction), each rated on a Likert-type scale from 1–10, with lower scores indicating greater patient satisfaction. We also added three additional questions: CS scar aesthetics, where 0 = ‘not at all aesthetic’ and 10 = ‘very aesthetic’; satisfaction with CS scar, where 0 = ‘not at all satisfied’ and 10 = ‘very satisfied’; and scar pain, where 0 = ‘no pain’ and 10 = ‘extreme pain’.

Complications were also assessed at a 6-month follow-up via a questionnaire (ie, not medical records) and included wound infections, seromas, hematomas, wound dehiscence, and surgical reintervention.

The primary outcome of this study was the POSAS scale scores according to maternal and CS characteristics. The secondary outcomes were the complications rate, the scar pain, and the overall satisfaction at 6 months post-CS.

Statistical analyses

POSAS scores, patient responses to the items regarding satisfaction, aesthetics, and pain, and complications were compared based on maternal and CS characteristics. The Shapiro–Wilk test was performed to determine distribution normality. Because no continuous variables were normally distributed, they are all presented as medians (1st quartile–3rd quartile). Categorical variables are presented as frequency (percentage). Between-group comparisons were made using Mann–Whitney Wilcoxon tests for continuous variables and Fisher’s or chi-square tests for categorical variables. R studio software (version 4.2.1) was used for the data analysis (20).

Ethics

Women who met the inclusion criteria were informed about the study procedures (including medical record data collection and the 6-month post-CS questionnaire) via email. Participants could contact the researchers in cases of opposition to data use. This study was approved on May 29 ,2023, by the Research Ethics Committee in Obstetrics and Gynecology (CEROG 2023-OBS-0402) (21).

Conflict of Interest

No conflicts of interest have been declared.

Funding Information

The study was funded by European Institute of Innovation and Technology (EIT) Health as part of the QUICKSTITCH project.

RESULTS

During the study period, there were 423 CS deliveries, among which, 95 women did not meet the inclusion criteria (Figure 1). Among the 328 eligible participants, 53% (n = 176) completed the questionnaire. No significant differences in women and CS characteristics were observed between responders and nonresponders, except for greater pregnancy weight gain (10 vs. 11 kg; $p < 0.001$) and lower pregestational BMI (25.2 vs. 26.8 kg/m², $p = 0.032$) in the nonresponder group (Table S1 and S2).

The included sample had a median age of 33 years and a median pregestational BMI of 25.3 kg/m², with 21.5% ≥ 30 kg/m² (Table 1). CS timing varied, with 39% scheduled, 18% performed before labor, and 43% performed during labor. Most procedures were conducted under local anesthesia (87.5%), with a median duration of 49 minutes. Skin closure was mainly conducted using nonabsorbable sutures (65.9%), while absorbable sutures and staples were used in 29.5% and 4.5% of CS deliveries, respectively.

Table 2 shows the results from the POSAS and additional questions. The median total POSAS score was 28 (17–36). The median overall satisfaction score was 5 (3–7). Regarding the additional questions, the median aesthetics score was 6 (4–8), median satisfaction score was 7 (5–9), and median scar-related pain score was 1 (0–3).

Regarding differences in scar evaluations according to maternal characteristics (Table 3), the POSAS score was lower in participants with previous CS (23.5 [16–33] vs. 30 [18–37], $p = 0.043$). The satisfaction item score was significantly better for women with a fetus of gestational age ≤ 37 weeks (8 [5–10] vs. 7 [4.5–0], $p = 0.049$). The aesthetic item score was significantly better in participants without a smoking history (6 [4–8] vs. 5 [2–6], $p = 0.036$). Women with a previous CS reported significantly less pain (0 [0–2.25] vs. 2 [0–4], $p = 0.008$).

Regarding scar evaluations according to CS characteristics (Table 4), satisfaction was significantly worse among participants receiving Maylard laparotomy (4 [0–5] vs. 8 [5–9] for

Joel Cohen and 8 [3.5–9] for Pfannenstiel laparotomy, $p = 0.018$). Aesthetics was significantly better in participants receiving Joel Cohen laparotomy (6 [4–8] vs. 4.5 [2–8] for Pfannenstiel and 4 [0–6] for Maylard laparotomy, $p = 0.039$).

Complications occurred in 20.5% of deliveries, with the most common prevalences for wound dehiscence (11.9%), hematoma (10.2%), and infection (9.1%) (Table 2). Complication rates were higher in participants with a BMI ≥ 30 kg/m² (37% vs. 16%, $p = 0.01$), skin closure using staples (50% vs. 12% for absorbable suture and 22% nonabsorbable sutures, $p = 0.031$), and Maylard laparotomy (56% vs. 19% for Joel Cohen laparotomy and 17% for Pfannenstiel laparotomy, $p = 0.041$) (Tables 3 and 4).

Details of complications according to maternal and CS characteristics are shown in Tables S3 and S4.

DISCUSSION

Main results

The present findings suggest that POSAS scores, and therefore CS scar aesthetic outcomes, do not differ significantly based on maternal, surgical, or CS characteristics, except that scores are better among participants with a CS history. The occurrence of scar complications was significantly higher in participants with a BMI ≥ 30 kg/m², skin closure using staples, and Maylard laparotomy.

Interpretation

We investigated an important yet often underappreciated aspect of the postpartum experience: women's satisfaction with the aesthetic appearance of their CS scar. Among the various factors potentially influencing scar quality, the technique used for skin closure is of particular relevance. In our analysis, no statistically significant difference in POSAS scores based on skin closure technique was observed. This finding is consistent with that reported by Cromi et al., who conducted a randomized controlled trial (RCT) of 123 women to compare scar quality following different CS closure methods (10). Using both the POSAS and a visual analog scale, no significant difference in either subjective or objective scar assessment was found at either 2- or 6-month postpartum follow-up. Similarly, Rousseau et al. conducted an RCT of 101 women to evaluate their satisfaction and scar appearance 6 weeks post-CS (22). Likewise, no significant between-groups differences were observed for those with staples compared with subcuticular sutures. In 2014, Mackeen et al. supported these findings in their RCT of 746 women, reporting no difference in satisfaction with incision appearance between the two closure methods at 2 months postpartum (23). A 2015 meta-analysis by the same group, incorporating 12 studies (including the aforementioned RCTs) and representing a cumulative 3112 women, also concluded that aesthetic outcomes did not differ significantly between suture and staple groups at 2 months postpartum (mean difference = 0.27; 95% confidence interval

[CI]: -0.46 to 1.00) (9). Of note, these studies primarily focused on the closure technique without accounting for other potential influencing factors. Contrasting evidence was reported by Fleisher et al., who, in their RCT of 577 women, observed superior cosmetic outcomes with suture-based closures compared with staples at postpartum follow-up: median Patient Scar Assessment Scale scores were 15 (interquartile range [IQR]: 10–25) in the suture group compared with 20 (IQR: 11–28, $p < 0.01$) in the staple group (4). This discrepancy reflects the heterogeneous and still debated nature of the existing literature on this subject. It is worth noting that the predominant use of sutures over staples in our center may have influenced the lack of observed differences (4,10).

Furthermore, in our study, CS history was unexpectedly associated with improved aesthetic outcomes. This is in contrast to the existing literature, which often associates prior CS deliveries with higher complication rates, including wound infection, which can negatively affect scar appearance. Indeed, in their descriptive study of 75,947 deliveries, Chaim et al. reported more wound infection in participants with previous CS (adjusted odds ratio [aOR] = 1.34, $p = 0.012$) (24). Lastly, although the type of laparotomy could theoretically influence scar aesthetics, no significant associations were identified in our analysis, and this variable has not been systematically addressed in previous studies.

Concerning scar complications, the overall rate in our study was 20.5%, which appears higher than figures previously reported. For instance, Häger et al. reported a rate of 18.9% for local complications, and in 2015, Mackeen et al. found a wound complication rate of 8.9% (9,25). The elevated rate observed in our cohort may be partly explained by our use of self-reported complications, potentially leading to overestimation. Despite this difference in overall rates, the factors associated with complications herein are consistent with previously published data. Notably, we observed a higher complication rate associated with staple closure compared with sutures, in alignment with findings by Mackeen et al. (9). In their meta-analysis, suture

use was associated with a significantly lower risk of wound complications compared with staples (risk ratio: 0.49; 95% CI: 0.28–0.87). Regarding laparotomy type, previous studies have shown that the Maylard technique may be associated with increased intraoperative morbidity, such as greater postoperative pain, blood loss, and longer operative time compared with Joel Cohen and Pfannenstiel incisions (18). However, this does not seem to extend to wound complications, which contrasts with our findings showing a higher rate of wound complications when using the Maylard laparotomy technique. Indeed, a 2013 Cochrane review including four studies and 666 women found no significant difference in wound complication rates among these three laparotomy techniques (18). Similarly, Giacolone et al. reported no difference in wound complication rates between the Maylard and Pfannenstiel approaches (26). Our findings also corroborate existing evidence linking certain patient-related factors, particularly active smoking and obesity, with both suboptimal aesthetic outcomes and higher postoperative complication rates (27–31). For example, Conner et al. demonstrated a clear association between increasing BMI and wound complications (29). Compared with nonobese women (rate of 6.6%), increasing BMI was associated with an increased risk of wound complications: 9.2% for those with a BMI 30.0–39.9 (aOR = 1.4; 95% CI: 0.99–2.0), and 22.9% for those with a BMI \geq 50 (aOR = 3.0; 95% CI: 1.9–4.9).

Strengths and limitations

Several strengths and limitations of this study should be acknowledged. The use of the POSAS scale, a standardized and validated tool, enabled a rigorous, patient-centered assessment of scars. Additionally, our inclusion of specific questions on satisfaction, aesthetics, and pain provided enriched data beyond the conventional POSAS framework. However, scar evaluation relied solely on patient self-reports, without an objective observer assessment, which is important given the known variability in patients' scar perceptions. The comparative analysis of numerous maternal and surgical factors, along with a 6-month postoperative evaluation,

offers a more realistic and longer-term view of scar appearance compared with studies focusing on the immediate postoperative period (4,32). In addition, our study sample was well-defined, with strict inclusion and exclusion criteria, enhancing internal validity. However, excluding patients with risk factors for complications and poor healing (eg, uncontrolled diabetes, history of keloids) may have limited the generalizability of the findings. Furthermore, the moderate response rate of 53% introduces the possibility of selection bias, as women who were more concerned with their scars may have been more likely to participate. This bias is further highlighted by differences between respondents and nonrespondents (eg, weight gain, BMI). Lastly, complications were reported exclusively through a self-administered questionnaire at 6 months, which could lead to recall or underreporting bias.

CONCLUSION

The results of the present study provide valuable insights into aesthetic outcomes and complications following CS, assessed at 6 months postpartum using the POSAS scale and patient-reported outcomes. Our findings indicated that while the skin closure method did not significantly influence scar appearance, prior CS delivery was associated with better POSAS scores. Importantly, complication rates were higher in women with obesity, those receiving staple closure, and following a Maylard laparotomy.

By integrating both clinical and patient-centered measures, this study highlights the multifactorial nature of scar healing and underscores the need for individualized surgical decision-making to optimize both medical and aesthetic outcomes. Future prospective studies that include both patient and observer assessments and extended follow-up periods are warranted to refine further best practices in CS closure.

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FIGURES AND TABLES

Figure 1: Flow Chart

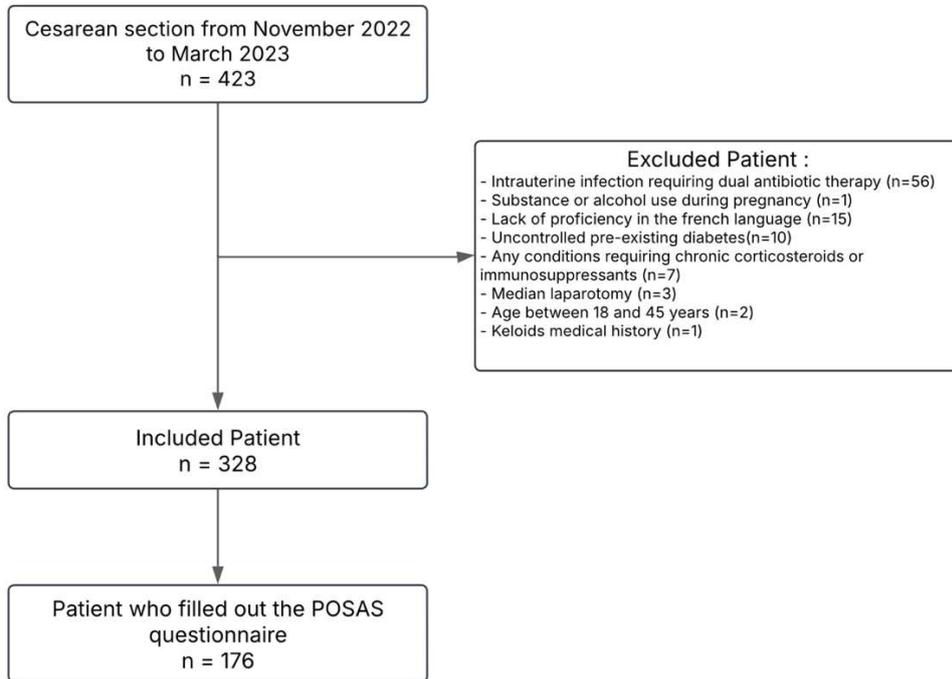


Table 1 - General Population and Cesarean section Characteristics

Description of the general population – ITT (intention to treat)

	Respondent (n=176)
Age, y	33 (29-36)
Pre-gestational BMI, kg/m²	25.3 (21.7-29.4)
Pre-gestational BMI > 30 kg/m²	38 (21.5%)
Weight gain during pregnancy, kg	11 (8-15)
Pre-existing hypertension	4 (2.3%)
Diabetes	14 (8%)
History of cesarean section	60 (34%)
Delay between the previous and the current cesarean section, months	44 (29-70)
Gestational age, weeks	37.1 (35.7-38.4)
Parity	2 (1-2)
Twin pregnancy	15 (8.5%)
Pre-eclampsia	11 (6.3%)
Active smoking during pregnancy	19 (11%)
Meconium-stained amniotic fluid	28 (16%)
Timing of cesarean section (on-call)	69 (39.2%)
Type of anesthesia	
Local anesthesia	154 (87.5%)
General anesthesia	16 (9.1%)
Local + general anesthesia	6 (3.4%)
Type of cesarean section	
Scheduled	69 (39 %)
Before labor	32 (18%)
During labor	75 (43%)
Cesarean section duration, minutes	49 (40-59)
Type of incision	
Joel Cohen	143 (81.25%)
Pfannenstiel	24 (13.64%)
Maylard	9 (5.11%)
Peroperative bleeding, mL	500 (300-800)
Skin closure	
Non-absorbable non-continuous suture	116 (65.91%)
Absorbable intradermal running suture	52 (29.55%)
Staples	8 (4.55%)

Results presented as number (percentage) or median (Q1 – Q3).

Table 2 - Responses to the POSAS Scale and complication occurrence

Total POSAS score (/60 points)	28 (17-36)	
POSAS score per item (/10 points)	Has the scar been painful in the past few weeks?	2 (1-4)
	Has the scar been itchy in the past few weeks?	2 (1-5)
	Is the color of the scar different now from your normal skin color?	6 (4-8)
	Is the stiffness of the scar different now from your normal skin?	5 (2-7)
	Is the thickness of the scar different now from your normal skin?	5 (2.75-7)
	Is the scar more irregular now than your normal skin?	5 (2-7)
POSAS Overall opinion (/10 points)	What is your overall opinion of the scar compared to normal skin?	5 (3-7)
Additional questions (/10 points)	What do you think of the aesthetics of your cesarean scar?	6 (4-8)
	Are you satisfied with your cesarean scar?	7 (5-9)
	Is your cesarean scar painful?	1 (0-3)
Occurrence of complication	Total Wound complication	36 (20.5%)
	Seromas	6 (3.4%)
	Hematomas	18 (10.2%)
	Wound dehiscence	21 (11.9%)
	Infection	16 (9.1%)
	Surgical re-intervention	3 (1.7%)

Results presented as number (percentage) or median (Q1 – Q3). The different elements of the POSAS score are in bold.

Table 3 - Results According to Maternal Characteristics

		POSAS total (/60 points)	Patient satisfaction (/10 points)	Aesthetics (/10 points)	Pain (/10 points)	Complications¹ (n=)
Maternal age	< 35 y.o. (n=115)	27 (17.5-35)	8 (5-9)	6 (4-8)	2 (0-4)	22 (19%)
	≥ 35 y.o. (n=61)	29 (16-38)	7 (4-9)	6 (3-9)	1 (0-3)	14 (23%)
Body mass index	< 30 kg/m ² (n=138)	28 (19-35.75)	8 (5-9)	6 (4-8)	1 (0-3)	22 (16%) **
	≥ 30 kg/m ² (n=38)	27 (15-36.75)	7 (5-9)	6 (4-9)	1 (0-3)	14 (37%)
Weight gain	Expected (n=102)	28 (19.5-35.5)	7 (5-9)	6 (4-8)	1 (0-10)	17 (17%)
	Excessive (n=71)	25 (14.5-36)	8 (5-10)	6 (4-8)	1 (0-10)	19 (28%)
Pre-gestational diabetes	Yes (n=14)	28 (17.5-35.5)	6.5 (5-9)	5.5 (4-7.5)	0.5 (0-4.5)	5 (36%)
	No (n=162)	27.5 (17-36)	8 (5-9)	6 (4-8)	1 (0-3)	31 (19%)
Gestational diabetes	Yes (n=35)	30 (19-35)	7 (5-9.5)	6 (4-8)	2 (0-3)	10 (29%)
	No (n=141)	26 (17-36)	7.5 (4-9)	6 (4-8)	1 (0-3)	26 (18%)
Active smoking	Yes (n=19)	30 (24.5-34)	7 (4.5-9)	5 (2-6) *	2 (0-4.5)	4 (21%)
	No (n=157)	27 (16-36)	8 (5-9)	6 (4-8)	1 (0-3)	32 (20%)
History of cesarean section	Yes (n=60)	23.5 (16-33) *	7 (4-9)	5.5 (3-8)	0 (0-2.25) **	14 (23%)
	No (n=116)	30 (18-37)	8 (5-9)	6 (4-8)	2 (0-4)	22 (19%)
Number of fetuses	Singleton gestation (n=161)	27 (17-36)	7 (4.75-9)	6 (3-8)	1 (0-3)	33 (21%)
	Multiple gestation (n=15)	28 (22.5-30.5)	8 (6-10)	7 (6-8)	1 (0-2.5)	3 (20%)
Gestational age at the time of cesarean section, weeks	≤ 37 (n=28)	26.5 (18.25-30)	8 (5-10) *	6.5 (4-8)	0.5 (0-3)	3 (11%)
	> 37 (n=148)	28 (17-36.25)	7 (4.5-9)	6 (4-8)	1 (0-3)	33 (22%)

Results presented as number (percentage) or median (Q1 – Q3). *: p <0.05 / **: p <0.01/ ***: p<0.001 – Significant differences highlighted in bold.

¹ Complications: infections, seromas, hematomas, wound dehiscence, surgical reintervention.

Table 4 - Results According to Cesarean Section Characteristics

		POSAS total (/60 points)	Patient Satisfaction (/10 points)	Aesthetics (/10 points)	Pain (/10 points)	Complications ¹ (n=)
Cesarean section indication	Scheduled (n=69)	27 (20-35)	7 (4-9)	5 (3-8)	1 (0-3)	15 (22%)
	During labor (n=107)	28 (15.5-36)	8 (5-9)	6 (4-8)	2 (0-3)	21 (20%)
During labor	Green code (n=37)	31 (18-37)	8 (5-9)	6 (4-9)	2 (0-3)	9 (24%)
	Orange/red code (n=38)	26 (14.25-35.75)	6.5 (4-9)	5.5 (3.25-8)	1 (0-5)	7 (18%)
Laparotomy type	Joel Cohen (n=143)	28 (17-36)	8 (5-9) *	6 (4-8) *	1 (0-3)	27 (19%) *
	Pfannenstiel (n=24)	24 (14-30)	8 (3.5-9)	4.5 (2-8)	0 (0-2.25)	4 (17%)
	Maylard (n=9)	33 (28-43)	4 (0-5)	4 (0-6)	2 (0-7)	5 (56%)
Skin closure	Non-absorbable suture (filapeau) (n=116)	28 (17-36)	7 (4.75-9)	5 (4-8)	1 (0-3)	26 (22%) *
	Absorbable suture (monocryl) (n=52)	26 (16.75-35)	8 (5-10)	7 (5-9)	1 (0-2.25)	6 (12%)
	Staples (n=8)	37 (20.75-46.75)	7 (3-9)	5 (2.75-8.25)	2 (1.5-5)	4 (50%)
Periodicity of cesarean occurrence	Working days ² (n=107)	26 (17-36)	7 (5-9)	5 (4-8)	1 (0-3)	20 (19%)
	On-call (n=69)	30 (17-36)	8 (5-9)	6 (4-8)	2 (0-4)	16 (23%)

Results presented as number (percentage) or median (Q1 – Q3). *: p <0.05 / **: p <0.01/ ***: p<0.001 – Significant differences highlighted in bold.

¹ Complications: infections, seromas, hematomas, wound dehiscence, surgical reintervention.

² Working days: Refers to performing the cesarean section between 8 a.m. and 6 p.m. excluding weekends and public holidays.

Table S1: Description of Respondents vs. Non-Respondents Characteristics

	General population	Respondent (n=176)	Non respondent (n=152)	p-value
Age, y	33 (29-36)	32 (28-36)	33 (29-36)	0.4
Pre-gestational BMI, kg/m²	25.9 (22.5-30)	26.8 (23.4-30.9)	25.2 (21.7-29.4)	0.032
Pre-gestational BMI > 30 kg/m²	83 (23%)	38 (21,5%)	45 (30%)	0.082
Weight gain during pregnancy, kg	10 (7-15)	10 (5-13)	11 (8-15)	<0.001
Pre-existing hypertension	13 (4%)	9 (6%)	4 (2.3%)	0.086
Diabetes	31 (9.5%)	17 (11.3%)	14 (7.9%)	0.4
Number of previous cesarean section	0 (0-1)	0 (0-1)	0 (0-1)	0.06197
History of previous cesarean section	124 (38%)	64 (43%)	60 (34%)	0.11
Delay between the previous and the current cesarean section, months	40.5 (28.3-67)	39 (27.5-65)	44 (29 – 69.5)	0.52
Gestational age, day	39.1 (38-40.4)	39.1 (38.3-40.4)	39.3 (37.8-40.6)	0.76
Parity	2 (1-3)	2 (1-3)	2 (1-2)	0.25
Multiple gestation	22 (6.7%)	7 (4.7%)	15 (8.5%)	0.25
Pre-eclampsia	23 (7.1%)	12 (8%)	11 (6.2%)	0.5
Active smoking during pregnancy	58 (17.8%)	24 (16%)	34 (19.3%)	0.4
Meconium-stained amniotic fluid	49 (15%)	21 (14%)	28 (15.9%)	0.6

Results presented as number (percentage) or median (Q1 – Q3).

Table S2 - Description of Respondents vs. Non-Respondents C-Section Characteristics

	General population	Respondent (n=176)	Non respondent (n=152)	p-value
Timing of cesarean section (on-call)	140 (42.9%)	71 (47.3%)	69 (39.2%)	0.14
Type of anesthesia				0.4
Local anesthesia	283 (86.81%)	129 (86%)	154 (87.5%)	
General anesthesia	27 (8.28%)	11 (7.33%)	16 (9.1%)	
Local + general anesthesia	16 (4.91%)	10 (6.67%)	6 (3.4%)	
Type of cesarean section				0.6
Scheduled	124 (38.04%)	55 (36.67%)	69 (39.21%)	
Before labor	60 (18.40%)	28 (18.66%)	32 (18.18%)	
During labor	142 (43.56%)	67 (44.67%)	75 (42.61%)	
Indication of cesarean section				
Fetal heart rate abnormality	102 (31.3%)	51 (34%)	51 (29%)	0.3
Cervical dystocia	68 (20.9%)	33 (22%)	35 (19.9%)	0.6
Scar uterus	115 (35.3%)	58 (38.7%)	57 (32.4%)	0.2
Multiple pregnancy	20 (6.1%)	5 (3.3%)	15 (8.5%)	0.052
Breech or transverse presentation	41 (12.6%)	20 (13.3%)	21 (11.9%)	0.7
Suspected macrosomia	25 (7.7%)	16 (10.7%)	9 (5.1%)	0.06
Placental abnormality	10 (3.1%)	3 (2%)	7 (4%)	0.4
Cord prolapse	3 (0.9%)	1 (0.7%)	2 (1.1%)	0.9
Failed instrumental delivery	5 (1.5%)	1 (0.7%)	4 (2.3%)	0.4
Non-progression of the presentation without instrumental help	11 (3.4%)	3 (2%)	8 (4.6%)	0.2
Mother-to-child transmission of maternal infection	3 (0.9%)	2 (1.3%)	1 (0.6%)	0.6
Other	39 (12%)	19 (13%)	20 (11%)	0.7
Caesarean duration, min	49 (40 – 58)	49 (40-57)	49 (40-59)	0.8
Laparotomy				0.3
Joel Cohen	254 (77.91%)	111 (74%)	143 (81.25%)	
Pfannenstiel	51 (15.64%)	27 (18%)	24 (13.64%)	
Maylard	21 (6.44%)	12 (8%)	9 (5.11%)	
Peroperative bleeding, mL	500 (300-800)	450 (300-700)	500 (300-800)	0.4
Skin closure medical device used				0.3
Non-absorbable suture (filapeau)	225 (69.02%)	109 (72.67%)	116 (65.91%)	
Absorbable suture (monocryl)	85 (26.07%)	33 (22%)	52 (29.55%)	
Staples	16 (4.91%)	8 (5.33%)	8 (4.55%)	

Results presented as number (percentage) or median (Q1 – Q3).

Table S3 - Complications Based on Maternal Characteristics

		Scar infections n= (%)	Seromas n= (%)	Hematomas n= (%)	Wound dehiscence n= (%)	Surgical reintervention n= (%)
Maternal age	< 35 y.o. (n=115)	12 (10%)	6 (5%)	11 (10%)	15 (13%)	3 (3%)
	> 35 y.o. (n=61)	4 (7%)	0 (0%)	7 (11%)	6 (10%)	0 (0%)
Body mass Index	≤ 30 kg/m2 (n=138)	8 (6%) *	3 (2%)	13 (9%)	13 (9%)	2 (1%)
	> 30 kg/m2 (n=38)	8 (21%)	3 (8%)	5 (13%)	8 (21%)	1 (3%)
Weight gain	Expected (n=102)	9 (9%)	3 (3%)	9 (9%)	11 (11%)	1 (1%)
	Excessive (n=71)	7 (10%)	3 (4%)	9 (13%)	10 (14%)	2 (3%)
Pre-gestational diabetes	Yes (n=14)	3 (21%)	2 (14%)	1 (7%)	2 (14%)	2 (14%)
	No (n=162)	13 (8%)	4 (3%)	17 (11%)	19 (12%)	1 (1%)
Gestational diabetes	Yes (n=35)	5 (14%)	3 (9%)	5 (14%)	5 (14%)	2 (6%)
	No (n=141)	11 (8%)	3 (2%)	13 (9%)	16 (11%)	1 (1%)
Active smoking	Yes (n=19)	2 (11%)	1 (5%)	4 (21%)	3 (16%)	0 (0%)
	No (n=157)	14 (9%)	5 (3%)	14 (9%)	18 (12%)	3 (2%)
History of cesarean section	No (n=116)	8 (7%)	2 (2%)	8 (7%)	13 (11%)	1 (1%)
	Yes (n=60)	8 (13%)	4 (7%)	10 (17%)	8 (13%)	2 (3%)
Number of fetuses	Singleton gestation (n=161)	16 (10%)	6 (4%)	15 (9%)	20 (12%)	3 (2%)
	Multiple gestation (n=15)	0 (0%)	0 (0%)	3 (20%)	1 (7%)	0 (0%)
Gestational age at the time of cesarean section, weeks	≤ 37 (n=28)	2 (7%)	0 (0%)	1 (4%)	2 (7%)	0 (0%)
	> 37 (n=148)	14 (10%)	6 (4%)	17 (12%)	19 (13%)	3 (2%)

Results presented as number (percentage) or median (Q1 – Q3). *: p <0.05 / **: p <0.01 / ***: p <0.001– Significant differences highlighted in bold.

Table S4 - Complications Based on Cesarean Section Characteristics

		Scar infections n= (%)	Seromas n= (%)	Hematomas n= (%)	Wound dehiscence n= (%)	Surgical reintervention n= (%)
Cesarean indication	Scheduled (n=69)	9 (13%)	3 (4%)	12 (17%) *	10 (15%)	2 (3%)
	During labor (n=107)	7 (7%)	3 (3%)	6 (6%)	11 (10%)	1 (1%)
During labor	Green code (n=37)	3 (8%)	0 (0%)	2 (5%)	4 (11%)	0 (0%)
	Orange/red code (n=38)	3 (8%)	2 (5%)	5 (13%)	3 (8%)	0 (0%)
Laparotomy type	Joel Cohen (n=143)	11 (8%) *	2 (1%) **	12(8%)	14 (10%) *	1 (1%) *
	Pfannenstiel (n=24)	2 (8%)	2 (8%)	3 (13%)	4 (17%)	0 (0%)
	Maylard (n=9)	3 (33%)	2 (22%)	3 (33%)	3 (33%)	2 (22%)
Skin closure	Non-absorbable suture (n=116)	12 (10%) ***	4 (3%) **	12 (10%) *	15 (13%) *	2 (2%)
	Absorbable suture (n=52)	0 (0%)	0 (0%)	3 (6%)	3 (6%)	0 (0%)
	Staples (n=8)	4 (50%)	2 (25%)	3 (38%)	3 (38%)	1 (13%)
Periodicity of cesarean occurrence	Working days ² (n=107)	11 (10%)	3 (3%)	12 (11%)	14 (13%)	2 (2%)
	On-call (n=69)	5 (7%)	3 (4%)	6 (9%)	7 (10%)	1 (1%)
Peroperative bleeding, mL	≤ 1000 (n=154)	16 (10%)	5 (3%)	16 (10%)	19 (12%)	3 (2%)
	> 1000 (n=22)	0 (0%)	1 (5%)	2 (9%)	2 (9%)	0 (0%)

Results presented as number (percentage) or median (Q1 – Q3). *: p <0.05 / **: p <0.01 / ***: p <0.001– Significant differences highlighted in bold.

² Working days: Refers to performing the cesarean section between 8 a.m. and 6 p.m. excluding weekends and public holidays.

DISCUSSION

Résultats principaux

Les résultats de la présente étude suggèrent que les scores POSAS, et donc les résultats esthétiques des cicatrices de césarienne, ne diffèrent pas significativement en fonction des caractéristiques maternelles, chirurgicales ou propres à la césarienne, à l'exception de meilleurs scores observés chez les participantes ayant un antécédent de césarienne. L'apparition de complications cicatricielles est significativement plus fréquente chez les participantes avec un IMC ≥ 30 kg/m², une fermeture cutanée par agrafes et une laparotomie selon la technique de Mouchel.

Interprétation

Nous avons étudié un aspect important mais souvent sous-estimé de l'expérience du post-partum : la satisfaction des femmes quant à l'apparence esthétique de leur cicatrice de césarienne. Parmi les différents facteurs susceptibles d'influencer la qualité de la cicatrice, la technique de fermeture cutanée est particulièrement pertinente. Dans notre analyse, aucune différence statistiquement significative des scores POSAS selon la technique de fermeture cutanée n'a été observée. Ce constat est cohérent avec celui rapporté par Cromi et al. dans leur essai contrôlé randomisé incluant 123 femmes comparant l'esthétique de la cicatrice après différentes méthodes de fermeture cutanée (10). À l'aide du POSAS et d'une échelle visuelle analogique, aucune différence significative, ni subjective ni objective, n'a été retrouvée dans l'évaluation de la cicatrice aux suivis à deux et six mois du post-partum. Il en est de même pour l'essai randomisé contrôlé de Rousseau et al., incluant 101 femmes pour évaluer leur satisfaction et l'aspect cicatriciel à six semaines post-césarienne (22). De nouveau, aucune différence significative entre les groupes n'a été observée entre les fermetures par agrafes et par sutures sous-cutanées. De plus en 2014, Mackeen et al. confirmaient ces résultats dans leur essai contrôlé randomisé portant sur 746 femmes, ne rapportant aucune différence de

satisfaction concernant l'apparence de l'incision entre les deux méthodes de fermeture à 2 mois du post-partum (23). Une méta-analyse conduite en 2015 par la même équipe, intégrant 12 études (dont les trois précitées) et représentant un total de 3112 femmes, a également conclu à l'absence de différence significative des résultats esthétiques entre les groupes sutures et agrafes à deux mois post-opératoire (différence moyenne = 0,27 ; intervalle de confiance [IC] à 95 % : -0,46 à 1,00) (9). À noter que ces études se sont principalement concentrées sur la technique de fermeture, sans prendre en compte d'autres facteurs potentiellement influents. À l'inverse, Fleisher et al. ont rapporté des résultats contradictoires dans leur essai contrôlé randomisé incluant 577 femmes, avec de meilleurs résultats esthétiques pour les fermetures par sutures comparativement aux agrafes lors du suivi post-partum : les scores médians de l'évaluation Patient de l'échelle POSAS étaient de 15 (intervalle interquartile [IIQ]: 10–25) dans le groupe sutures contre 20 (IIQ: 11–28, $p < 0,01$) dans le groupe agrafes (4). Cette divergence reflète l'hétérogénéité et le caractère encore débattu de la littérature sur ce sujet. Il convient de souligner que l'usage prédominant des sutures dans notre cohorte, par rapport aux agrafes, a pu contribuer à l'absence de différences observées (4,10).

En outre, dans notre étude, les antécédents de césarienne étaient, de façon inattendue, associés à de meilleurs résultats esthétiques. Ce constat contraste avec la littérature existante, qui associe fréquemment les antécédents de césarienne à un taux plus élevé de complications, notamment infectieuses, susceptibles de nuire à l'apparence cicatricielle. En effet, dans leur étude descriptive portant sur 75 947 accouchements, Chaim et al. ont rapporté un taux plus élevé d'infections locales chez les patientes ayant un antécédent de césarienne (odds ratio ajusté [ORa] = 1,34, $p = 0,012$) (24). Enfin, bien que le type de laparotomie puisse théoriquement influencer l'esthétique cicatricielle, aucune association significative n'a été identifiée dans notre analyse, et on ne retrouvait pas d'étude de cette variable dans les travaux précédents de la littérature.

Concernant les complications cicatricielles, le taux global observé dans notre étude était de 20,5 %, qui semble être relativement élevé comparativement aux études antérieures. Par exemple, Häger et al. rapportaient un taux de 18,9 % de complications locales, et en 2015, Mackeen et al. identifiaient un taux de complications de paroi de 8,9 % (9,25). Le taux plus élevé observé dans notre cohorte peut s'expliquer en partie par l'utilisation de complications auto-déclarées, susceptible de conduire à une surestimation. Malgré cette différence de taux global, les facteurs associés aux complications dans notre étude sont cohérents avec les données de la littérature. Nous avons notamment observé un taux de complications plus élevé avec les fermetures par agrafes qu'avec les sutures, en accord avec les conclusions de Mackeen et al. (9). Dans leur méta-analyse, l'utilisation de sutures était associée à une réduction significative du risque de complications de paroi par rapport aux agrafes (risque relatif : 0,49 ; IC à 95 % : 0,28–0,87).

Concernant le type de laparotomie, certaines études antérieures montraient que la technique selon Mouchel pouvait être associée à une morbidité per-opératoire accrue, telle qu'une douleur post-opératoire plus importante, des pertes sanguines majorées et une durée opératoire prolongée, comparativement aux incisions selon Joel Cohen et selon Pfannenstiel (18). Cependant, cela ne semble pas s'appliquer aux complications de paroi, ce qui contraste avec nos résultats, qui en montrent davantage lors de l'utilisation la technique de laparotomie selon Mouchel. En effet, dans la revue de la Cochrane de 2013, incluant quatre études et 666 femmes, aucune différence significative des taux de complications locales entre ces trois techniques de laparotomie n'a été démontrée (18). De même, Giacolone et al. ne trouvaient pas de différence selon les techniques de laparotomie selon Mouchel et Pfannenstiel (26). Nos résultats corroborent également les données existantes reliant certains facteurs liés aux patientes, en particulier le tabagisme actif et l'obésité, à des résultats esthétiques moins favorables et à un risque accru de complications post-opératoires (27–31). À titre d'exemple, Conner et al. ont

démontré une association claire entre l'augmentation de l'IMC et les complications de paroi (29). Comparativement aux femmes non obèses (taux de 6,6 %), l'augmentation de l'IMC était associée à un risque plus élevé de complications : 9,2 % pour un IMC compris entre 30,0 et 39,9 (ORa = 1,4 ; IC à 95 % : 0,99–2,0) et 22,9 % pour un IMC \geq 50 (ORa = 3,0 ; IC à 95 % : 1,9–4,9).

Forces et limites

Plusieurs forces et limites de cette étude doivent être soulignées. En effet, l'utilisation de l'échelle POSAS, un outil standardisé et validé, a permis une évaluation des cicatrices de césariennes rigoureuse et centrée sur les patientes. De plus, l'inclusion de questions spécifiques sur la satisfaction, l'esthétique et la douleur a permis d'enrichir les données au-delà du cadre conventionnel de l'échelle POSAS. Toutefois, l'évaluation de la cicatrice reposait uniquement sur les déclarations des patientes, sans évaluation objective par un observateur, une donnée importante compte tenu de la variabilité connue dans la perception des cicatrices par les patientes et les soignants. L'analyse comparative de nombreux facteurs maternels et chirurgicaux, associée à une évaluation à six mois post-opératoire, offre une vision plus réaliste et à long terme de l'apparence de la cicatrice par rapport aux études centrées sur la période post-opératoire immédiate (4,32). Par ailleurs, notre échantillon avec des critères d'inclusion et d'exclusion stricts renforce la validité interne. Cependant, l'exclusion de patientes présentant des facteurs de risque de complications et de mauvaise cicatrisation (par exemple, le diabète non contrôlé ou les antécédents de chéloïdes) limite la généralisation des résultats. De plus, le taux de réponse modéré de 53 % introduit un risque de biais de sélection, les femmes les plus préoccupées par leur cicatrice étant potentiellement plus enclines à participer. Ce biais est encore illustré par les différences entre répondantes et non-répondantes (par exemple, prise de poids, IMC). Enfin, les complications ont été rapportées exclusivement via un questionnaire auto-administré à six mois, ce qui peut engendrer un biais de mémorisation ou sous-déclaration.

CONCLUSION

Les résultats de la présente étude apportent des éléments précieux sur les résultats esthétiques et les complications après césarienne, évalués à six mois post-partum à l'aide de l'échelle POSAS et des déclarations des patientes. Nos résultats indiquent que, si la méthode de fermeture cutanée n'a pas significativement influencé l'apparence cicatricielle, un antécédent de césarienne était associé à de meilleurs scores POSAS et donc un meilleur résultat esthétique. Il est important de souligner que les taux de complications étaient plus élevés chez les femmes présentant une obésité, celles ayant bénéficié d'une fermeture cutanée par agrafes et après une laparotomie selon la technique de Mouchel.

En intégrant à la fois des mesures cliniques et centrées sur les patientes, cette étude met en évidence le caractère multifactoriel de la cicatrisation et souligne la nécessité d'une prise de décision chirurgicale individualisée afin d'optimiser les résultats esthétiques et limiter les complications. Des études prospectives, incluant à la fois l'évaluation par les patientes et par les observateurs, ainsi qu'un suivi prolongé, sont nécessaires pour affiner encore les bonnes pratiques chirurgicales et le suivi post-opératoire individualisé.

ANNEXE

POSAS Patient scale

The Patient and Observer Scar Assessment Scale v2.0 / EN

Date of examination: _____

Observer: _____

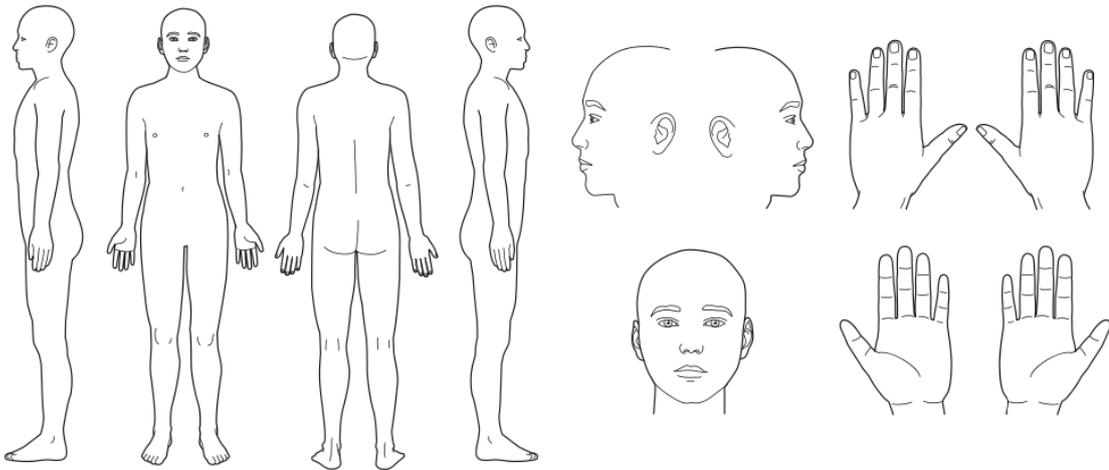
Location: _____

Research / study: _____

Name of patient: _____

Date of birth: _____

Identification number: _____



1 = no, not at all yes, very much = 10

1 2 3 4 5 6 7 8 9 10

HAS THE SCAR BEEN PAINFUL THE PAST FEW WEEKS?

HAS THE SCAR BEEN ITCHING THE PAST FEW WEEKS?

1 = no, as normal skin yes, very different = 10

1 2 3 4 5 6 7 8 9 10

IS THE SCAR COLOR DIFFERENT FROM THE COLOR OF YOUR NORMAL SKIN AT PRESENT?

IS THE STIFFNESS OF THE SCAR DIFFERENT FROM YOUR NORMAL SKIN AT PRESENT?

IS THE THICKNESS OF THE SCAR DIFFERENT FROM YOUR NORMAL SKIN AT PRESENT?

IS THE SCAR MORE IRREGULAR THAN YOUR NORMAL SKIN AT PRESENT?

1 = as normal skin very different = 10

1 2 3 4 5 6 7 8 9 10

WHAT IS YOUR OVERALL OPINION OF THE SCAR COMPARED TO NORMAL SKIN?

AUTEURE : Nom : PRUVOST

Prénom : Juliette

Date de soutenance : 25/11/2025

Titre de la thèse : Résultats esthétiques et complications des cicatrices de césarienne : évaluation à six mois par le questionnaire Patient and Observer Scar Assessment Scale

Thèse - Médecine - Lille - 2025

Cadre de classement : gynécologie-obstétrique

DES : gynécologie-obstétrique

Mots-clés : Esthétique, Césarienne, POSAS, Fermeture cutanée, Complications de paroi

Résumé :

Contexte : La césarienne est une intervention chirurgicale fréquente à l'échelle mondiale. Au-delà des risques de complications à court et long terme, l'esthétique de la cicatrice représente un facteur déterminant dans la satisfaction des patientes, influencée par les caractéristiques maternelles et les techniques chirurgicales.

Objectif : Évaluer la satisfaction des femmes concernant l'aspect esthétique de leur cicatrice six mois après césarienne en utilisant l'échelle Patient and Observer Scar Assessment Scale et identifier les facteurs maternels et chirurgicaux associés.

Méthodes : Il s'agit d'une étude comparative monocentrique, réalisée à Lille entre novembre 2022 et mars 2023. L'évaluation du critère de jugement principal reposait sur l'échelle POSAS (Patient and Observer Scar Assessment Scale), un score sur 60 points, où une valeur plus basse indique un meilleur résultat esthétique avec trois questions supplémentaires : satisfaction, douleur, complications locales (hématome, infection, désunion, reprise chirurgicale, sérome). Les données ont été analysées selon les caractéristiques maternelles et chirurgicales.

Résultats : Parmi les 328 femmes éligibles, 176 (53 %) ont répondu. Le score médian POSAS était de 28 (17–36). Une meilleure esthétique cicatricielle et satisfaction étaient observées chez les femmes ayant des antécédents de césarienne, non fumeuses, et opérées par laparotomie selon Joel Cohen. Des complications post-opératoires ont été rapportées par 20,5 % des répondantes, les plus fréquentes étant la désunion (11,9 %), l'hématome (10,2 %) et l'infection (9,1 %). Leur survenue était significativement plus fréquente chez les patientes ayant un IMC ≥ 30 kg/m² (37 % vs 16 % ; p=0,01), en cas de fermeture par agrafes (50 % vs 12 % fil résorbable et 22 % non résorbable ; p=0,031) ou après incision type Mouchel (56 % vs 19 % Joel Cohen et 17 % Pfannenstiel ; p=0,041).

Conclusion : Ces résultats soulignent l'impact des choix chirurgicaux et des facteurs maternels sur l'esthétique et les complications des cicatrices de césarienne, renforçant l'intérêt d'une approche individualisée et d'un suivi à long terme.

Composition du Jury :

Président : Monsieur le Professeur Damien SUBTIL

Asseseurs :

- Madame le Docteur Louise GHESQUIERE
- Madame le Docteur Yasmine OULD HAMOUD

Directeur de thèse : Monsieur le Professeur Charles GARABEDIAN